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Rear Admiral Bartholomew W. Hogan MC USN - Surgeon General
 Captain Leslie B. Marshall MC USN (RET) - Editor

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Policy

The U. S. Navy Medical News Letter is basically an official Medical Department publication inviting the attention of officers of the Medical Department of the Regular Navy and Naval Reserve to timely up-to-date items of official and professional interest relative to medicine, dentistry, and allied sciences. The amount of information used is only that necessary to inform adequately officers of the Medical Department of the existence and source of such information. The items used are neither intended to be, nor are they, susceptible to use by any officer as a substitute for any item or article in its original form. All readers of the News Letter are urged to obtain the original of those items of particular interest to the individual.

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Trends in Cardiovascular Syphilis

Cardiovascular syphilis remains a serious threat to life and health despite its decreasing incidence and the increasingly efficient armamentarium of the cardiologist. This study was undertaken to determine the prevalence of cardiovascular syphilis in similar hospital populations, to describe changing methods of diagnosis and treatment, and to determine, insofar as possible, the effect of such treatment on the course of the disease.

According to the records of the Los Angeles County Hospital for 1945-1954, 1002 persons were admitted during that period with diagnoses of "cardiovascular syphilis," "blood vessel syphilis," and/or "aneurysm of thoracic aorta." Charts of 954 of these patients were sufficiently detailed for use in compiling this report. Included in the 954 patients were 723 men (491 white, 232 colored) and 231 women (121 white, 110 colored).

On the average, the colored patients within this study were about 5 years younger than the white patients at the time the diagnosis of cardiovascular syphilis was made, mean age of the white patients being 60.6 years, mean age of the colored patients, 55.8 years. In white persons, cardiovascular syphilis most commonly was diagnosed between 60 and 69 years of age (both men and women); but in colored men the greatest incidence fell between the ages of 50 and 59; in colored women the condition was discovered most often between 40 and 49.

In this study, diagnosis of cardiovascular syphilis was based upon presence of characteristic cardiovascular lesions plus (a) a history of syphilitic infection; (b) a history of antisiphilitic treatment, or (c) a positive serologic test for syphilis. Evidence of rheumatic heart disease was not considered to be inconsistent with a diagnosis of cardiovascular syphilis. Roentgenologic evidence of aortitis was of great help and in many cases was conclusive. About 27% of aortitis cases were first recognized at autopsy

as were 18.5% of cases of syphilitic aortic aneurysm and about 1.2% of cases of aortic insufficiency.

Only 275 patients (28.8%) were able or willing to give the date of their initial infection. Four times as many men as women gave information as to date of infection. The mean number of years between initial infection and diagnosis of cardiovascular syphilis was approximately 29.

Serologic reactions were positive or repeatedly doubtful in 82% of cases studied. As might have been anticipated from reports of other investigators, the effect of penicillin therapy on serologic reactions was disappointing: positive reactions became negative following penicillin therapy in only 4.6% of penicillin-treated cases. Treatment with bismuth and/or arsenicals and malaria made serologic reactions negative in 2.4%; treatment with bismuth and/or arsenicals and penicillin caused a similar change in 1.3% of treated cases. In 23% of cases studied, spinal fluid reactions for syphilis were positive.

The most frequent complication of cardiovascular syphilis is congestive heart failure, present in 67.5% of the patients under study and especially common in persons with syphilitic aortic insufficiency. Commonly, congestive heart failure starts with failure of the left ventricle; if the patient does not die in acute left heart failure, the condition progresses within a matter of a few weeks to several years to failure of the right side of the heart. Other frequent complications of cardiovascular syphilis are hypertension, angina pectoris with or without myocardial infarction, and rupture of an aortic aneurysm.

Roentgenologic evidence of syphilitic cardiovascular disease was present in 91.2% of cases examined and proved particularly helpful in diagnosis of uncomplicated syphilitic aortitis and aneurysm.

Eighty-four and four-tenths percent of patients with cardiovascular syphilis died in the first 5 years after diagnosis. An additional 10% died in the next 5-year period. If undiagnosed cases of syphilitic aortitis are included in the tally, persons with aortic insufficiency make up the group of patients most likely to survive the first 5 years following diagnosis. Naturally, the patient's age at the time of diagnosis is a factor in survival. During the first 5 years after diagnosis, not much difference is apparent in mortality of persons who were under 59 at the time the diagnosis was established, the incidence of deaths being roughly 30%. Over 60, this percentage increases with increasing age. In the next 5-year period after diagnosis, however, practically none in the age group under 39 at the time of diagnosis died from cardiovascular syphilis; but 7% of persons in the 40- to 49-year category at the time cardiovascular syphilis was diagnosed died in that interval; 14% of persons in the 50- to 59-year category died between the fifth and tenth years following diagnosis.

Hypertension influenced prognosis unfavorably decreasing the period of survival following diagnosis of cardiovascular syphilis to 2.4 months under the average for the group. Complication of true diastolic hypertension

with syphilitic aortic aneurysm was very unfavorable; 77% of these patients died during the period under study. In 47% of these cases, cause of death was a ruptured or dissecting aneurysm. Angina pectoris caused an increase in death rate of 6% above the rate for the group as a whole.

Treatment of cardiovascular syphilis was found most effective if given prophylactically, i. e., in the form of early and adequate treatment of early syphilis. In cases receiving early treatment, the life expectancy is over 100% improved as compared with untreated cases.

Evaluation of penicillin therapy in established lesions of the cardiovascular system is difficult because investigators remain undecided as to when treatment has reached its full effect. However, as attempts to produce a penicillin-resistant strain of Treponema pallidum have failed, and evidence of true resistance of Treponema pallidum to penicillin has not been established, adequate treatment should be effective. Some authors speculate that the disappearance of syphilitic granulomatous tissue from the aorta is a matter of months and perhaps years, and that little, if anything, happens to the lesions during actual treatment. Nevertheless, observations at autopsy have shown a decrease in lymphocytic and plasma cell infiltration of the aortic wall in cases of aortitis where penicillin treatment was given at least 10 weeks before death. Probably another 10 weeks or more are needed for healing to become complete and for penicillin therapy to reach its full effect. This period may vary somewhat, depending upon the extent of the lesions and the amount of granulation tissue present and may possibly be somewhat longer in more advanced cases. Perhaps differences in regenerative powers of persons in various age groups are involved.

The death rate from cardiovascular syphilis in the United States underwent a 22% reduction in the years between 1939 and 1948. Nevertheless, at least 35% of the patients in this study died from sequelae of syphilitic cardiovascular lesions in the first 5 years after cardiovascular syphilis was diagnosed. (Rimsa, A., Griffith, G. C., Trends in Cardiovascular Syphilis: Ann. Int. Med., 46: 915-921, May 1957)

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Obesity in Adults

From the medical point of view, the variety of approaches to the problem of obesity reveals the confused state of present knowledge. There is the glandular approach with the use of thyroid and, sometimes, pituitary preparations, often in large amounts. Then there is the approach through the dispensing of anorectic drugs which are expected to perform miracles. There is the dietary approach with prescriptions of low caloric diets, egg diets, high fat diets, high protein diets, and even low protein diets, and finally, unfortunately, there is the "scolding" approach in which the patient

is implicitly or explicitly accused of "cheating" or of "lying" or branded as a "glutton" and belittled for "lack of will power."

Obviously, physicians are faced with a disease exceedingly common in occurrence and extremely resistant to treatment. It carries an enormous penalty in physical unattractiveness and discomfort, a high incidence of accompanying illnesses (diabetes, hypertension, cholelithiasis, et cetera), and a higher mortality rate. An understanding of the factors that are involved in the development of obesity should provide a more sympathetic approach to the obese patient as well as aid in the prevention of obesity.

Basically, the problem of obesity may be considered as occurring in two phases, one active, the other static. For the development of the active phase of obesity, certain factors must be present. There must be plenty of food, and there must be such a relation between "appetite" and "satiety" that the energy intake exceeds the energy expenditure. Where heredity plays a role, and to what extent, must be left to future studies to determine. The active phase may be slow in development and may persist over a period of many years or it may occur rapidly and be of relatively short duration.

Slowly developing active phase. This type of obesity is quite common. It is exemplified by the individual who gains weight, perhaps as little as two pounds per year throughout adult life. Such an individual often reports little or no change in his eating habits and yet he gradually increases in weight.

This is the type to which most of the adult population is prone in a greater or lesser degree. The social role of food as an adjunct for successful gatherings and the non-nutritive use of food while watching television and sports events may become important factors. When this is accompanied by a decrease in physical activity—which is almost universal—the balance of energy is definitely in favor of a gain in weight. But even if there is no increase in food consumption, the decrease in basal energy expenditure and the inevitable decrease in physical activities will result in a continued gain in weight. Prevention of this type of obesity involves a gradual decrease in food intake with advancing years and an effort to overcome the tendency toward a completely sedentary existence.

Rapidly developing active phase. Several types of rapidly developing active phases can be recognized. First, there is the type associated with pregnancy, the so-called maternal obesity. In this type the onset occurs during pregnancy (usually between the fourth and sixth months) or immediately following delivery. The weight may increase 75 to 150% within 6 to 12 months and is usually followed by a static phase. The active phase may occur with each pregnancy or with only one pregnancy. Heredity may play a role because such patients are twice as likely to have had obese mothers as are nonobese women and frequently they themselves were overweight at birth. The increase in weight is associated with a ravenous appetite and an absence of a feeling of satiety. Peculiar eating habits and craving

for certain foods are common. Physical activity may be diminished. The result is a marked distortion of the balance between intake and output of energy.

A second type is found associated with operations. The onset occurs postoperatively and is usually rapid, although often not so rapid as in the maternal type. Usually this is associated with an increased food intake for the purpose of getting "built up" after the operation.

A third type occurs in association with emotional trauma. In general, this occurs with, or following, a threat to the self. This threat may be to self-esteem, such as a feeling of not being loved or needed, a feeling of inadequacy in a job or in a marital relationship, or a feeling of being unable to be a part of one's social group. It may be a threat to self-preservation, for example, following poverty or a serious threat to one's life. It may be a threat to self-propagation, for example, death or illness of a child, inability to become pregnant, or even fear of becoming pregnant. The development of obesity here is related to an increased appetite and a decreased satiety. In some instances, a "night-eating pattern" has been described. This is characterized by evening hyperphagia, insomnia, and morning anorexia. Depression and a decrease in physical activity are often present. If forced to reduce, a patient with this type of problem is likely to become irritable and more depressed.

Another type may occur following damage to the brain, as in encephalitis, fracture of the base of the skull, or subarachnoid hemorrhage or after frontal lobectomy. The onset is usually abrupt. A rare manifestation is the Kleine-Levin syndrome or the syndrome of episodes of hypersomnia, bulimia, and abnormal mental states. This syndrome usually follows an infectious disease. Some evidence suggests that the frontal lobes or the hypothalamus, or both, are involved.

A final type is that which occurs during the menopause. It differs from the slowly developing active type in that the active phase is somewhat more abrupt and more rapidly developed and in the fact that there may be associated psychologic factors, such as depression, feelings of loneliness, a sense of futility, and of not being needed. Usually, an increased appetite and decreased satiety, a decrease in physical activities, and often an increase in the non-nutritive use of food are present.

The active phase of obesity is usually followed by a static phase rather than by a return of weight to normal. During the static period, the weight is maintained usually within fairly narrow limits at the elevated level. This may persist for months or years to be followed by another active phase and then the establishment of another static phase at a higher level. Physical activity may be restricted to varying degrees, but usually the appetite is not increased and the food intake is not excessive. In fact, the patient frequently is speaking the truth when in this phase he claims that he eats very little food, for the caloric needs to maintain this phase may be very limited.

The eating pattern often is distorted: breakfast is commonly avoided, lunch may be inadequate, and the evening meal may provide the major source of food for the day.

At the outset, the fact must be frankly faced that the long-term treatment of obesity—no matter what the therapeutic program—is very disappointing. Undoubtedly, it will continue so until a clearer understanding has been reached of the metabolic disturbances which lead to an imbalance between energy consumption and expenditure. In the meantime, the problem will persist and must be faced with sympathy and intelligence.

The obese patient must be given as much attention and thought as any other patient with a metabolic problem. To begin with, considerable time should be devoted to obtaining an accurate history of the development of the obesity, the familial aspects of an overweight tendency and of eating habits, the results of previous attempts to reduce, and any disturbances that may have accompanied such attempts, and then any emotional factors that preceded or accompanied the development of obesity. The patient should be assured that the physician understands the difficulty of the problem and that lack of success is not to be considered a "failure" in the sense of a "moral" weakness in the patient. It is well to inform the patient at the beginning of the program that weight reduction should proceed slowly, perhaps at the rate of 2 to 4 lbs. per month. He should be advised not to get on the scales daily looking for results and, in addition, should be warned of the likelihood of "plateau periods" which may persist for 2 to 4 weeks. In this manner, many a patient is guided through periods in which he would become so discouraged that he would tend to give up the program.

On the whole, it is essential to avoid using any thyroid preparation and probably best to avoid anorectic drugs because such preparations tend to divert the attention from the main problem and actually, in long-term studies, are of little value.

There has long been a tendency to minimize the importance of exercise in a weight reduction regimen. This has resulted from a feeling that exercise tends to increase appetite and from calculations, such as that an individual must walk 36 miles to lose 1 lb. Nevertheless, it should be realized that a certain degree of exercise added to a sedentary existence will cause no increase in appetite. While an individual may need to walk 36 miles to lose 1 lb., by the same token a walk of 1 mile daily will not affect the appetite and will be equivalent to a weight loss of 10 lbs. in one year.

The diet program for the obese patient has always played the major role. Unfortunately, too often the sole program has consisted in handing a low-calorie diet to the patient and wishing him "good luck." The patient looks on the diet as a punishment and is likely to file it in the wastepaper basket. Rather than emphasizing the diet as a diet, the physician should concentrate on correcting the eating habits, training the patient to sit at the

table and to eat three times each day, to eliminate from the diet the so-called "empty calories," and to include in the diet low calorie, but bulky, foods so that the meals are not scanty in volume.

Lastly, the patient must be convinced that the doctor realizes that the difficulty of weight reduction is not the fault of the patient, but of the nature of the patient's problem. His relapses must be met with patience and encouragement and he must never be allowed to consider himself a "failure." (Murphy, R., Obesity in Adults: Postgrad. Med., 21: 466-470, May 1957)

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Use and Misuse of Acetazoleamide

Since the discovery that the carbonic-anhydrase-inhibiting drug acetazoleamide (Diamox) brings about a lowering of the intraocular pressure, its use has been widespread in the treatment of glaucoma. Its pressure lowering effect is due solely to a lessening of the rate of aqueous production. The obstruction to outflow of aqueous is uninfluenced by acetazoleamide. Thus, the use of this drug in the treatment of glaucoma must be regarded as a palliative treatment because it in no way affects the fundamental cause of increased intraocular pressure—obstruction to outflow. Such palliative treatment is often of tremendous value in preventing damage to vision while other measures are employed to relieve the fundamental difficulty.

Any new and valuable addition to the therapeutic armamentarium is usually hailed with enthusiasm and may be used unwisely. This has been true of the sulfonamides and antibiotics and of the steroids. It is becoming increasingly apparent that acetazoleamide is being unwisely used in the treatment of some forms of glaucoma. Its greatest field of usefulness is in the treatment of secondary glaucoma. Secondary glaucoma, by definition, is a rise in ocular tension secondary to some other eye disease. If the fundamental disease can be cured, the secondary glaucoma is likewise cured. Where formerly palliative surgical procedures were frequently employed in cases of secondary glaucoma to prevent serious damage to the vision from increased tension while the disease was running its course, now acetazoleamide serves the same purpose and has proved to be of tremendous value.

In open angle glaucoma at all stages of the disease, the angle is always open, and thus, aqueous always has access to the filtration apparatus. The obstruction to outflow which results in increased ocular tension resides somewhere in the filtration apparatus. This form of glaucoma is treated by miotics and, when it is uncontrolled, by various filtering operations to increase drainage from the anterior chamber. In this form of glaucoma, acetazoleamide, if tolerated by the patient, may be used at any stage of the disease. Its pressure-lowering effect as an adjunct to miotic therapy may protect the eye from damage while it is being used so that in some cases operation can, thereby, be avoided. The use of acetazoleamide has no

deleterious effect on the disease itself. It does not lessen the effectiveness of any other form of therapy, either medical or surgical, and in open angle glaucoma there is no contraindication to its use save the unpleasant side effects experienced by some patients.

In angle closure glaucoma, the situation is quite different. Here, the obstruction to outflow is due solely to closure of the angle. The outflow channels—at least in the early stages of the disease—are completely normal, and tension rises and falls as the angle closes and opens either spontaneously or under the influence of miotics. The level of tension is a fairly accurate guide as to the extent of the angle which is closed at a given time. Thus, in a case of angle closure glaucoma at a time when the tension is normal either spontaneously or under the influence of miotics, one can assume—and gonioscopy confirms the assumption—that the angle is completely open or nearly so.

In another case, if the tension is considerably elevated, one can assume that a considerable extent of the angle is closed—and gonioscopy confirms this assumption. It is well known that in angle closure glaucoma, if the tension remains elevated and the angle closed, sooner or later this portion of the angle becomes permanently closed by peripheral anterior synechias. Although the tendency to the formation of permanent peripheral anterior synechias varies greatly in different eyes, it is an ever-present danger; it is impossible to predict in a given case whether anterior synechias will form after a single episode of closure or only after repeated closures. Treatment of angle closure glaucoma of whatever type is predominantly surgical. Iridectomy results in opening of all portions of the angle not already permanently closed by synechias. In an early case where there are only a few or no peripheral anterior synechias, peripheral iridectomy effects a complete and permanent cure. If operation is deferred until a considerable portion of the angle is permanently closed by synechias, a filtering operation is required and in these neglected cases all operations may fail and the eye may be lost. Thus, it can be seen that here is a form of glaucoma in which in the early stages a simple surgical procedure effects a complete cure of the disease and in the late stages all treatment may fail. This is well recognized and documented by wide experience.

If acetazoleamide is employed along with miotics in the treatment of angle closure glaucoma, the level of tension is no longer a guide as to the extent of closure of the angle. Without acetazoleamide, a rise in tension to 40 or 50 mm. Hg means closure of a considerable portion of the angle and this would be an indication for early surgical intervention to forestall permanent closure by synechias. If in such a case acetazoleamide is used, tension usually falls to the normal range, thus giving a false sense of security while the angle may remain closed. If this treatment is continued, sooner or later the angle may be permanently closed by synechias, the chance for relief of the glaucoma by simple peripheral iridectomy has been lost and there is now a permanent glaucomatous state. Gradually, more and more of the

angle closes and in spite of miotic therapy and acetazoleamide, tension eventually rises and a more formidable operation has to be undertaken. Now, only a filtering operation will suffice and because a large portion of the angle is closed by peripheral anterior synechias, only very free filtration will keep the tension at normal levels. Aside from the possibility of failure of the eye to develop a filtering scar and, hence, failure of control of tension, the operative hazards are far greater with filtering operations than with iridectomy.

Once operation is decided on in angle closure glaucoma and the patient is being prepared for operation, acetazoleamide is a most valuable adjunct to therapy. One sees patients with acute glaucoma in whom miotic therapy alone fails to lower the tension, but in whom the tension can be brought to normal if acetazoleamide is also employed. In subacute angle closure glaucoma, acetazoleamide used in the immediate preoperative period is very valuable in reducing the tension and thus lessening the operative risk. Thus, as an immediate preoperative treatment, acetazoleamide serves a very useful purpose in all types and stages of angle closure glaucoma. The author believes, however, that it should never be used as a continuing treatment in any form of angle closure glaucoma as a substitute for prompt operation, because it masks the danger signs and symptoms as does morphine given for abdominal pain and may lead to disastrous delay in definitive surgical treatment. After operation for angle closure glaucoma, either iridectomy or a filtering procedure, there may be a certain amount of residual glaucoma. Operation has opened all portions of the angle not permanently closed by synechias and no further closure will take place. The residual glaucoma is now a permanent state and will not become significantly better or worse as time passes. In some cases, further operation is required, but in many instances, the residual increased tension can be controlled by medical means. Here there is no contraindication to the use of acetazoleamide. It may be used freely because there is no longer the problem of further closure of the angle and no longer the problem of masking the signs and symptoms. This is simply a question of controlling the residual increased tension by all available means.

Acetazoleamide is a most valuable addition to the medical armamentarium in the management of glaucoma. Its greatest field of usefulness is in the secondary glaucomas, but it is often very helpful in open angle glaucoma. The author believes that it has no place in the treatment of angle closure glaucoma except in the immediate preoperative period and as a postoperative treatment for residual glaucoma. (Chandler, P.A., Use and Misuse of Acetazoleamide (Diamox) in the Treatment of Glaucoma: Arch. Ophth., 57: 639-641, May 1957)

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Meconium Ileus and Meconium Peritonitis

Meconium ileus is one of the manifestations of fibrocystic disease of the pancreas. Intestinal obstruction in an infant is always a serious problem. When the obstruction is due to meconium ileus, the problem is doubly serious because successful surgical relief of the obstruction may be followed by other complications of fibrocystic disease of the pancreas.

Meconium peritonitis may accompany meconium ileus if a prenatal perforation of the intestine occurs. The perforations are usually found in the distended segment of the intestine proximal to the obstruction. Meconium peritonitis has also been found in association with other types of congenital intestinal obstructions. It is of considerable interest that meconium peritonitis may occur without coexisting intestinal obstruction. In some patients who had meconium peritonitis without obstruction, fibrocystic disease of the pancreas was present. The characteristic clinical features are vomiting, abdominal distention, and failure to expel meconium stools.

In patients with uncomplicated meconium ileus, the surgical treatment was essentially enterotomy, removal of the thick meconium, instillation of a solution containing pancreatic substance, and closure of the enterotomy.

Patients in whom meconium ileus was complicated by volvulus, gangrene, perforations, or meconium peritonitis often required resections in addition to removal of the meconium. These procedures were frequently difficult and adversely affected the results. The surgeon has no standardized operation to perform on patients with complicated meconium ileus or severe meconium peritonitis. He must act according to the demands of the situation encountered.

Postoperatively, the treatment administered was directed at the associated mucoviscidosis. The essential feature of this phase of the therapy is a high caloric, high protein, and high simple sugar diet which is low in fat. Water-miscible vitamins (vitamin D, 2000 units; vitamin A, 10,000 units; vitamin B complex and ascorbic acid, 100 mg.) and pancreatic extracts (Viokase or Panteric granules) are important adjuncts to the diet. Salt should be used liberally; additional amounts are necessary in hot weather. Antibiotics are administered prophylactically as long as there is evidence of pulmonary involvement. All possible efforts should be made to prevent the occurrence of acute infectious diseases.

If patients with meconium ileus are successfully relieved surgically of their obstruction, subsequent management of the associated fibrocystic disease largely determines the prognosis. Almost all of these patients have pulmonary involvement and experience difficulty in getting rid of viscid bronchial secretions. Because of the increased loss of electrolytes in sweating, susceptibility to heat prostration is a constant danger in hot weather. Focal biliary fibrosis, probably due to inspissated secretions obstructing the hepatic ducts, has been observed. In some patients, this

process goes on to a diffuse hepatic cirrhosis. (Fox, P. F., Potts, W. J., Meconium Ileus and Meconium Peritonitis: Arch. Surg., 74: 733-738, May 1957)

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Cystinuria

In 1810, Wollaston described a "new species of urinary calculus." During the following 100 years, many further examples of the same kind of stone were identified and it was shown that they were composed almost entirely of the amino acid, cystine. Patients in whom such stones formed were found to be excreting large amounts of cystine continuously in their urine. The disorder was frequently familial and was recognized to be in some way genetically determined.

It is now known that cystine is not the only amino acid excreted in unusual quantities by patients in whom cystine calculi form. The basic amino acids, lysine, arginine and ornithine, are also regularly present in the urine in grossly abnormal amounts. This massive amino aciduria is continuous and probably persists with little change throughout life. Furthermore, the abnormality appears to be highly specific for these four substances.

Cystine may also be excreted in unusual amounts in a number of other genetically determined conditions. Among these may be mentioned cystinosis, the different variants of the De Toni-Debré-Fanconi syndrome, and Wilson's disease or hepatolenticular degeneration.

In the past, cystinosis has been confused with the type of cystinuria just described. However, it is now clear that these disorders may be sharply differentiated on clinical, biochemical, and genetic grounds. In particular, the amino aciduria found in such conditions is of a much more generalized type, involving some ten or more amino acids. Cystine stone formation rarely, if ever, occurs. It is convenient, therefore, to reserve the term "cystinuria" for the clinical condition involving recurrent cystine calculus formation as described by Wollaston and now known to be characterized by the abnormal excretion of cystine, lysine, arginine, and ornithine.

The term "cystine-lysinuria" has also occasionally been used in recent years to designate the condition. This is unsatisfactory because, as is pointed out, true cystine-lysinuria, when it occurs without concomitant arginine and ornithinuria, is only rarely associated with stone formation. The incorporation of all four amino acids in the name for the disease is somewhat cumbersome and now that the situation has been clarified, it seems simplest to retain the classic term cystinuria.

The loss of the four amino acids—even in these considerable amounts—does not lead to any obvious nutritional disturbances in the patients, provided

they are on a normal diet with an adequate protein content. All the clinical features of the condition can be attributed simply to the complication of recurrent formation of stones in the renal tract. Apart from the tendency to calculus formation and consequent obstruction in the renal tract, these patients may remain remarkably well. Surprisingly enough, chronic renal infection does not usually occur. The prime cause of the stone formation is undoubtedly the high urinary concentration of cystine. Cystine is one of the least soluble of amino acids and in urine between pH 5 and 7 it can be kept in solution only to the extent of 300 to 400 mg./L. In patients excreting between 0.5 gm. and 1 gm. of cystine per day, the concentration of this substance may frequently reach saturation level, particularly at night when the urine passed is most concentrated. Consequently, the cystine will tend to come out of solution and this will lead to calculus formation. Lysine, arginine and ornithine, on the other hand, are freely soluble and, therefore, do not become incorporated into the stones.

Diagnosis rests on the demonstration of grossly abnormal amounts of the four amino acids in the urine. Useful routine qualitative tests are the cyanide/nitroprusside test for cystine and two dimensional paper chromatography for amino acids. The three basic amino acids may also be easily demonstrated by ionophoresis in filter paper at pH 11.5. The abnormality is so gross that qualitative results by these methods are adequate for most purposes. Quantitative analyses are rather more difficult to carry out and are not necessary in ordinary clinical practice.

A therapeutic approach to the problem of stone formation would seem to depend on either an attempt to decrease the quantity of cystine excreted or to increase its solubility in urine, or finally, to attempt to increase the volume of urine flow so that at no time does the cystine concentration reach saturation levels.

The most direct method of influencing the quantity of cystine excreted would be by restriction of protein in the diet. Severe restriction of protein intake does, in fact, cause an appreciable reduction in cystine output. However, severe protein restriction is an undesirable therapy. Lysine is being excreted by these patients in even greater quantities than cystine and this is an essential amino acid. There could be a real danger of going into negative nitrogen balance, particularly if such therapy was applied in growing children. Neither moderate protein restriction nor a great increase in protein intake seems to have a very great effect on cystine output. There seems to be, therefore, no virtue in advising protein restriction.

The use of alkalis in order to render the urine more alkaline and, hence, to increase the solubility of cystine has been widely recommended. The difficulty here lies in the character of the pH solubility curve. The urine pH must evidently be raised to over pH 7.6 before any large increase in cystine solubility occurs. To reach and maintain such a high pH would require the continuous administration of extremely large doses of alkali

and this would not appear to be very practical for long periods as a prophylactic measure.

The most hopeful line of attack is to attempt to increase the volume of urine flow. It seems that the daily output of cystine could in the average patient be held in solution by about 3 L of urine at pH 6. The difficulty arises from the diurnal rhythm. It is fairly easy to maintain a high rate of flow during the day, but special measures are necessary at night. Dent and Senior recommend for routine practice that the patient, besides drinking approximately 3 L of liquid during the day, should also take at least two glasses of fluid before going to bed and another two glasses when he wakes to urinate at about 2 a.m. The best routine can be worked out individually for each patient. The aim should be to maintain a urine flow of at least 2 ml. per minute for each four-hour period throughout the day and night.

Even if this approach proves to be useful in preventing stone formation, it would perhaps be too hopeful to expect that it could succeed in dissolving large stones once they are formed. Its value, therefore, is likely to be mainly prophylactic, either to prevent stones from forming in predisposed persons or, once they have formed, to prevent recurrence after surgery. Here the genetical approach is of practical importance. One in four of the brothers and sisters of known cystinuric patients is likely to be similarly affected. If the urines of such persons are examined, it is comparatively easy to pick out the homozygous persons who are predisposed to stone formation, but in whom stones may not yet have formed. Proper advice can perhaps prevent them from ever doing so. (Harris, H., Robson, E.B., Cystinuria: *Am. J. Med.*, XXII, 774-782, May 1957)

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Fluoridation

The control of dental caries by water fluoridation has been the subject of articles and reports for more than a decade. Relatively complete bibliographies on this subject are included in previous review dissertations. It may be stated that all recognized scientific studies have demonstrated the certainty of this method as a public health procedure for securing better dental health for a community.

Although many of the studies on water fluoridation have been in progress long enough to evaluate the soundness of the procedure, much is to be learned concerning its various public health aspects. This article reviews briefly the results of 10 years of one of these research projects; the findings of the eleventh year of the study are summarized, particularly those observations which pertain to dental health programs; the findings are evaluated in respect to the results of other independent investigations of similar character. For this reason, the results of three of these studies covering the first 10 years of operation are discussed.

On the basis of these results and the data included in previous reports, one can conclude that fluoridation of public water supplies will effectively reduce the dental caries experience of those persons exposed to its effect continuously from birth onward. Also, sound scientific evidence shows that these beneficial results are not confined solely to those born subsequent to the inauguration of fluoridation. For example, the results shown for the 16-year age group indicate a reduction of 26% of the expected amount of caries.

A similar analysis of the data can be carried back into the results of previous reports on these studies, making comparisons on the basis of annual observations. Such an analysis suggests that the "caries susceptibility" of a tooth may be affected by water fluoridation even after the tooth had been formed and erupted. This hypothesis is more completely discussed and evaluated in another report. The evidence from the studies reviewed in this presentation indicates that fluoridation has a beneficial effect on teeth which are not fully formed or are not fully matured in the oral environment.

From the public health standpoint, there necessarily stems an interest in the practicability of the procedure. No attempt will be made to evaluate the economics of the technical aspects involved in water fluoridation other than to say that the process is comparatively inexpensive with only a rare exception. As far as dental health is concerned, there can be no doubt from the data shown that the dental health problem in Grand Rapids, for example, has been brought under a better measure of control. If considered only in terms of dollars and cents, the savings to this community have been tremendous over the past 11 years. Economic considerations of this character, however, are usually misleading as far as evaluating public health procedures are concerned.

As stated earlier, the effects of water fluoridation on public health from aspects other than dental caries were fully considered before the inauguration of any of these programs. On the basis of previous scientific evidence, investigators anticipated that water fluoridation would produce a slight increase in the prevalence of the mildest forms of dental fluorosis. Although sufficient time has not elapsed to evaluate this factor fully, the results to date show that the degree of fluorosis produced by fluoridation at levels recommended for caries control is of no public health significance.

In all of these studies, particular attention and interest has been paid to any effects fluoridation might have on other biologic systems of the body. In none of these studies has there been any scientific evidence to suggest an adverse effect on any segment of a rather large population living under divergent environmental conditions. These observations, in conjunction with the fact that millions of people have used naturally fluoridated waters for generations, attest to the complete safety of the procedure. (Arnold, F. A., Grand Rapids Fluoridation Study - Results Pertaining to the Eleventh Year of Fluoridation: Am. J. Pub. Health, 47: 539-545, May 1957)

The International Society of Internal Medicine

The International Society of Internal Medicine—the only international society embracing all aspects of internal medicine—was organized in 1948, largely at the instigation of Professor Nanna Swartz of Stockholm, the physician to the King of Sweden. Her contention was that the various branches of internal medicine should be kept in touch with one another as is accomplished in North America by the American College of Physicians, and that this should be done on a truly international basis. Professor Swartz also emphasized the importance of purely personal and nonpolitical contacts among physicians of different countries.

The objectives of the Society as stated in its Statutes are "to promote scientific knowledge in internal medicine, to further the education of the younger generation, and to encourage friendship among physicians of all countries." The members are "specialists in internal diseases, acknowledged as such and accepted by the appropriate national societies of internal medicine."

The first president of the International Society was Professor A. Gigon of Basel, Switzerland. He was succeeded, in 1952, by Dr. Swartz and she by Sir Russell Brain of London, the President of the Royal College of Physicians.

The Fifth Congress of the International Society of Internal Medicine will take place at the new Sheraton Hotel in Philadelphia on April 24 to 26, 1958. This will be the first meeting of the Society outside Europe. The previous Congresses, at two-year intervals, were held in Paris, London, Stockholm and Madrid. At those meetings, however, the United States, as well as many other nations throughout the world, was represented. The present membership of the Society, including forty-eight nations, is about 3000.

At the Philadelphia Congress, it is planned to analyze through lectures and panels medical achievements of worldwide significance, to evaluate certain apparent problems and to chart courses of action designed to enhance technical knowledge and to aid in the continuing war against disease. At the same time, the plan includes such social and cultural activities as will tend to promote cooperation, friendship, and mutual understanding among physicians and peace among their countries.

All Medical Corps officers who are internists are invited to become members of this Society. You may become a permanent member or a member for the coming Congress only. The dues are only \$5 for every two years. For further information and application blanks write to:

International Society of Internal Medicine
Office of the Secretary General
4200 Pine Street
Philadelphia, Pa.

(ProfDiv, BuMed)

Illustrated Lecture Available to Borrowers -
U. S. Naval Dental School

The U. S. Naval Dental School, National Naval Medical Center, Bethesda, Md., announces that it has available for loan an illustrated lecture on Remount Technique for Occlusal Correction of Complete Dentures. This lecture may be requested on a short term loan basis for individual study or seminar instruction or as a clinic for professional groups.

The package contains a hand viewer, slide file, carrying case, fifty-three 35 mm. colored slides and a bound narration in lecture form to accompany the slides. Ten of these packages are now available.

It is requested that those desiring to borrow this material forward a request as outlined below to:

Commanding Officer
U. S. Naval Dental School (Code 7)
National Naval Medical Center
Bethesda, Md.

From: _____

To: Commanding Officer, U. S. Naval Dental School (Code 7),
National Naval Medical Center, Bethesda, Md.

Subj: Remount Technique for Occlusal Correction of Complete
Dentures; request for loan of illustrated lecture on

1. It is requested that I be granted the loan of the illustrated lecture Remount Technique for Occlusal Correction of Complete Dentures for approximately 2 weeks.
2. It is requested that the period of the loan commence on, or about, _____ 195 , to expire not later than 2 weeks from date of receipt.
3. I will exercise due care in handling and stowing this training material and will return it in the original carton with the enclosed franked address labels attached at the expiration of the loan period.

(Signature)

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From the Note Book

1. The Surgeon General of the Navy, Rear Admiral B. W. Hogan, attended and participated in meetings of the 106th Annual Meeting of the American Medical Association, June 3 - 7, 1957. Rear Admiral B. E. Bradley MC USN, Deputy Chief of the Bureau of Medicine and Surgery, represented the Navy as Military Delegate at the meetings of the House of Delegates. (TIO, BuMed)
2. Captain W. C. Calkins MSC USN, Chief, Navy Medical Service Corps, will represent the Surgeon General of the Navy at the 60th Annual Congress of the American Optometric Association which will be held in Los Angeles, June 23 - 26, 1957. (TIO, BuMed)
3. All of the eighteen interns currently assigned to the U. S. Naval Hospital, Philadelphia, Pa., who during their internship have been Reserves, recently accepted appointments in the Regular Navy. Seventeen of these newly appointed Lieutenants in the Regular Navy will remain on after completion of their internship on 30 June 1957 at the Philadelphia Naval Hospital for residency training. The eighteenth will go to San Diego, Calif., for residency training in Ophthalmology. At the same time, an appointment in the Regular Navy was delivered to LT Mable A. Frew MC USN. LT Frew has been on duty since 6 March 1957. She joins CAPT Frances L. Willoughby MC USN as the second woman Naval Medical officer on the staff of the Philadelphia Naval Hospital at the present time. (USNH, Philadelphia, Pa.)
4. A cobalt irradiator, with a cobalt source of 500 curies, has been placed in clinical use at the National Naval Medical Center, Bethesda, Md. The irradiator is believed to be the first one in clinical use in the Armed Forces. (TIO, BuMed)
5. A report of the first detailed study of patients in proprietary nursing homes has been published by the Public Health Service. It gives the most complete information so far compiled about the age, sex, and disabilities of patients in these homes. The average age of the patients is 80, and all but 1% are over 45. Two-thirds of the patients are women. One-fifth are confined to bed all the time while less than half can walk without some form of assistance. More than half of the patients were reported as being mentally confused—at least part of the time. Two of every five have cardiovascular conditions and many have arthritis or rheumatism. (PHS, HEW)
6. Twelve instances, from general practice, of acute immediate reactions following injections of preparations of penicillin are recorded. The nature of these reactions and their possible modes of production are discussed.

It is suggested that they may be produced either by (1) intramuscular injection of penicillin in sensitized individuals; (2) accidental intravascular injection or back-seepage in sensitized individuals; (3) accidental rapid intravascular injection of procaine penicillin suspensions. (Brit. M. J., 18 May 1957; G. W. Lewis, M. B.)

7. The effect of diathermy employed in retinal reattachment operations on the coats of the human eye at different intervals of time following operation is illustrated by pathologic specimens. A suggestion for avoiding damage to vortex veins is made. (Am. J. Ophth., May 1957; E. Tamler, M.D.)

8. Osteoporosis is a metabolic bone disease in which the bone mass is reduced as a result of an inappropriately low rate of bone matrix formation. It is the only one in which circulating calcium, phosphorus, and phosphatase concentrations are normal. It may result from inactivity, from estrogen or androgen lack, from excess of adrenal cortical hormone, from a deficiency of nitrogenous precursors, or from an unknown cause. (Am. J. Med., May 1957; F. C. Bartter, M.D.)

9. To date, 37 cases of aminophylline toxicity in infants and children have been reported with 11 deaths. The treatment of aminophylline poisoning is purely symptomatic and involves the immediate discontinuation of the drug and the use of appropriate supportive measures. (J. Pediat., June 1957; H. Soifer, M.D.)

10. Three hundred and ninety-one cases of perforated appendicitis which were operated on without mortality are presented. Mode of preparation, technique of surgery, and postoperative care are outlined. (Arch. Surg., May 1957; R. M. Bolman II, M.D., R. P. Lloyd, M.D., R. R. Johnson, M.D.)

11. A series of case reports are presented showing that selective use of serum protein-bound iodine determination is a valuable aid in the management of certain thyroid disorders. (Postgrad. Med., May 1957; G. O. Bell)

12. The diagnosis, treatment, and prevention of hypercortisonism in patients with rheumatoid arthritis is discussed in Proceedings of the Staff Meetings, Mayo Clinic, Vol. 32, No. 9, dated 1 May 1957; C. H. Slocumb, M.D., H. F. Polley, M.D., L. E. Ward, M.D.

13. The nature, incidence, pathology, pathogenesis, and clinical manifestations of amyloidosis are discussed in Ann. Int. Med., May 1957; G. L. Bero, M.D.

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Board CertificationsAmerican Board of Anesthesiology

LTJG James C. Appleton (MC) USNR (Inactive)
LT Julia M. Cullen (MC) USNR (Inactive)

American Board of Internal Medicine

LTJG Ralph I. Cottle, Jr. (MC) USNR (Inactive)
LCDR John J. Dempsey (MC) USN
CAPT Willis A. Murphy (MC) USNR (Inactive)

American Board of Obstetrics and Gynecology

LT Robert G. Campbell (MC) USNR (Inactive)
LT Henry H. Fetterman (MC) USNR (Inactive)
LTJG George E. McCaskey, Jr. (MC) USNR (Inactive)
LTJG Pelletier H. Supple (MC) USNR (Inactive)

American Board of Ophthalmology

LTJG Robert W. Petty (MC) USNR (Inactive)

American Board of Orthopedic Surgery

LTJG William E. Nelson (MC) USNR (Inactive)

American Board of Otolaryngology

LT John R. Williams (MC) USNR (Inactive)

American Board of Pathology

LCDR Albert Cannon (MC) USN - Pathologic Anatomy
CDR Frank K. Harder (MC) USNR (Inactive)
LTJG Maurice M. Helpern (MC) USNR (Inactive)
LT Ned N. Kuehn (MC) USNR (Active) - Pathologic Anatomy
LT John H. Liles, Jr. (MC) USNR (Inactive)

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LT Fred N. Smith (MC) USNR (Inactive)
LT Oscar S. Spivey (MC) USNR (Inactive)

American Board of Plastic Surgery

LT Sanford Glanz (MC) USNR (Inactive)

American Board of Preventive Medicine

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LTJG Edward R. Hipp, Jr. (MC) USNR (Inactive)
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LTJG Bernard L. Willett (MC) USNR (Inactive)

American Board of Thoracic Surgery

LT Daniel E. Mahaffey (MC) USNR (Inactive)

American Board of Urology

CDR Vincent M. Dungan (MC) USNR (Inactive)
LTJG Joseph H. Rappeport (MC) USNR (Inactive)

Recent Research ReportsNaval Medical Research Institute, NNMC, Bethesda, Md.

1. High Pressure Oxygen Effects on the Transport of Potassium, Sodium, and Alpha-Ketoglutarate in Guinea Pig Kidney Cortex Slices. NM 004 005.09 .03, 10 October 1956.
2. Use of the Fluorescence Technique as an Absolute Method for Obtaining Mean Relaxation Times of Globular Proteins. NM 000 018.06.54, 17 December 1956.
3. Extent of Deesterification of Glycerol Pectate in Vitro and in Vivo. NM 000 018.14.01, 21 December 1956.
4. Studies upon Fluorescent Insulin Conjugates. NM 000 018.06.55, 17 December 1956.
5. Intensity of Illumination and the Rate of Responding in a Multiple Choice Situation. NM 000 019.01.06, 4 January 1957.
6. Rate of Responding as a Function of Inter-Trial Interval. NM 000 019 .01.05, 4 January 1957.
7. Swelling of Protein Molecules in Solution. II. Memorandum Report 57-1. NM 007 081.15, 8 January 1957.
8. Organ and Tissue Distribution of the Exoerythrocytic Stages of Various Avian Malarial Parasites. NM 005 048.01.12, 14 January 1957.
9. Triggering of Contraction in Skeletal Muscle. Lecture and Review Series No. 57-1. 15 January 1957.

Naval Medical Research Unit No. 3., Cairo, Egypt

1. Changes in Blood Glucose During the Metabolism of Hydroxybutyrate. NM 007 082.30.01, June 1956.
2. Effect of Ammonium Intoxication upon the Metabolism of B Hydroxybutyrate. NM 007 082.30.02, June 1956.
3. The Different Clinical Picture of Brucellosis in Egypt. NM 007 082.11.09, June 1956.
4. Keys to the Lizards and Snakes of Egypt. NM 005 050.39.45, October '56.
5. Results of the NAMRU 3 Southeastern Egypt Expedition, 1954. 5 Ticks (Ixodoidea) NM 005 050.39.52, February 1957.
6. Cardiopulmonary Studies in Schistosomiasis. Report #3. Bilharzial Pulmonary Hypertension Hemodynamic and Pharmacodynamic Studies. NM 72 01 03.4, April 1957.
7. Review of the Therapy of Brucellosis, NM 007 082.11.07, May 1957.

Naval Medical Research Unit No. 4, Great Lakes, Ill.

1. Growth of Influenza B Virus in Monkey Kidney Cultures. NM 005 051 .06.01, 23 January 1957.

2. Studies on the Host Range of the Influenza Group of Viruses. NM 005 051 .06.02, 28 January 1957.
3. Adaptation of the Millipore Filter in the Isolation of Beta Hemolytic Streptococci. NM 52 06 04 .1.1, 8 March 1957.
4. Evaluation of the Use of Outdated Human Blood Bank Blood for the Isolation of Beta Hemolytic Streptococci. NM 52 06 04.1.2, 8 March 1957.

Naval Air Development Center, Johnsville, Pa.

1. Responses of the Rat to Thermal Radiation. Report No. 11, NM 001 103 301, 30 October 1956.
2. Effect of Hypoxia on the Human Electroretinogram. Report No. 2, NM 001 110 300, 30 November 1956.
3. Catalytic Effect of Mitochrome on Electron Transfer Over the Respiratory Enzymes. Report No. 2, NM 001 110 316, 14 January 1957.
4. Effect of Mitochrome on Adenylate Kinase. Report No. 3, NM 001 100 316, 29 January 1957.
5. Arterial Blood Pressure Responses to Abrupt Positive Acceleration. NM 001 100 315, 1 March 1957.

Naval Medical Research Laboratory, Submarine Base, New London, Conn.

1. Report: U. S. Naval Dental Corps' Assistance to Support Force for U. S. Participation in IGY. NM 003 041.62.01, 30 January 1957.
(Additional listings in next issue)

DENTAL



SECTION

Color Television Teaching Facilities -
Naval Dental School

The first professional color television program produced by the U. S. Naval Dental School, National Naval Medical Center, Bethesda, Md., was presented by the Commanding Officer to 50 Navy Dental officers and invited guests on May 14, 1957. The one-hour program was the first of many which will be produced by the school to enhance the teaching program.

Captain J. V. Niiranen DC USN, Head of the Training Aids Department, directed the program which was projected to the U. S. Naval Dental School from the Walter Reed Army Institute of Research by closed circuit microwave.

The program featured demonstrations by Captain D. E. Cooksey DC USN on Extra-Oral Needle Insertion Techniques for Local Anesthesia; Captain H. J. Towle, Jr. DC USN on Management of an Obstructed Airway; and Commander R. B. Welden DC USN on Maxillofacial Prosthesis.

Among the Navy Dental officers and guests who attended the viewing were Rear Admiral R. W. Malone DC USN, Assistant Chief of the Bureau of Medicine and Surgery for Dentistry; Rear Admiral R. W. Taylor DC USN, Inspector General, Dental; Rear Admiral A. W. Chandler DC USN, Retired; and Rear Admiral S. O. Claytor DC USN, Retired.

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Meeting of Committee on Dentistry -
National Research Council

Captain W. R. Stanmeyer DC USN reported on the U. S. Antarctic Dental Program, International Geophysical Year, at the Twenty-sixth Meeting of the Committee on Dentistry, National Research Council of the National Academy of Sciences in Washington, D. C., on June 1, 1957. Captain F. L. Losee DC USN, Captain D. F. Cooksey DC USN, Commander H. W. Lyons DC USN, and Lieutenant Commander P. J. Boyne DC USN reported on the current status of Anorganic Bone Research.

An evaluation of Research Proposals on renewal applications and proposed projects was made by the Committee on Dentistry for the Office of Naval Research. The Committee made recommendations on projects to be supported by the Navy during fiscal year 1958.

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Dental Notes

LCDR Harold R. Englander DC USN, Naval Administrative Command, NTC, Great Lakes, Ill., was elected on May 23 1957 President of the Chicago Section of The International Association for Dental Research.

BuMed Instruction 6700.14A. Authorized levels of supply for medical and dental stores for vessels and activities not operating under Navy Stock Fund accounting procedures for Cognizance "L" material. This instruction defines levels of supply for medical and dental material carried aboard ships and consumer activities not operating under Navy Stock Fund accounting procedures for Cognizance "L" material. Formulae establishing levels of supply are presented.



RESERVE SECTION

Ensign, 1995, Medical Officers in Naval Internships

One hundred and fifty-three graduate medical students holding commissions as Ensign, 1995 (Medical) USNR, will commence training in the Naval Internship Program beginning 28 June 1957. Of this number, 114 were enrolled in the Navy's Senior Medical Student Program. Naval Internships, of which there are 200 authorized each year, are conducted at 17 naval teaching hospitals located throughout the continental United States.

* * * * *

The Navy's Senior Medical Student Program

In its third year of existence, the Navy's Senior Medical Student Program with 200 students enrolled, representing 65 approved medical schools, will commence during the coming fall months when the academic school year will begin. Established as a program with the Ensign, 1995 (Medical) USNR Program, its characteristics are:

1. This program is available to qualified students enrolled at medical schools accredited by the Council on Medical Education and Hospitals of the American Medical Association. Students who have completed their second year of medical school may make application for this training at any Office of Naval Officer Procurement or Main Recruiting Station. Active duty commences and continues while in attendance during their senior academic year. To be eligible for participation, the individual must be an Ensign, 1995 (Medical) U. S. Naval Reserve, or agree to accept such an appointment if selected. A board convened in the Bureau of Medicine and Surgery selects the candidates for participation in this program.
2. Physical standards of this program are the same as those established for Regular Navy staff corps officers.
3. Active duty commences upon receipt of orders and completion of proper reporting endorsements.
4. The trainee agrees in writing to accept a Regular Navy commission and if a Regular Navy commission is not tendered, accept an appointment in the Naval Reserve.
5. In accepting an appointment in the Regular Navy or Naval Reserve, as a result of having active service in the Senior Medical Student Program

as an Ensign, 1995, he is obligated to serve on active duty and to retain the commission for a period of three years. This active service will commence upon completion of not more than twelve months of a civilian or Naval Internship.

6. As a medical student, he receives the full pay and allowances of an Ensign, 1995, while so enrolled on active duty.

7. In addition to the pay and allowances, he is credited with two and one-half days of annual leave for each thirty days of active duty served.

8. The wearing of the naval uniform is permitted only when authorized by appropriate naval authority.

9. Timing is very important. An average of four months is required to completely process each application. 1 February each year is the absolute deadline that completed applications must be forwarded to the Bureau of Naval Personnel, Navy Department, Washington, D. C.

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Correspondence Course Training

Pharmacy and Materia Medica, NavPers 10999, is a course recommended for all Medical Department personnel.

This course aims to supplement the information of Medical Department personnel in the fields of pharmacy, materia medica, and toxicology. The course does not pretend to offer intensive or exhaustive study in any of these fields, but provides personnel with a broad understanding of them and gives information about standard procedures.

Course material includes information about pharmaceutical procedures and pharmaceutical arithmetic, prescriptions, and preparations. One section deals with the origin, composition, and properties of medicinal substances. The course also includes such subjects as pharmacognosy, pharmacy, pharmaceutical chemistry, pharmacology, therapeutics, posology, and toxicology.

This course will be found to be especially useful by physicians, pharmacy and chemistry technicians, Hospital Corps watch standing personnel, and personnel considering a course of instruction in pharmacy technique.

The course consists of eight objective question type assignments.

Satisfactory completion of the course will entitle eligible Naval Reserve personnel to 24 nondisability retirement credit points and 24 promotion points.

Pharmacy and Materia Medica, NavPers 10817, is used as a text.

In requesting this course, use application form NavPers 992 (revised 2-56). These forms can be obtained from your commanding officer or from district commandants.

Medical Department personnel other than Dental Department personnel: Address the application to Commanding Officer, U.S. Naval Medical School,

National Naval Medical Center, Bethesda 14, Md. Make the appropriate change in the "To" line in Box J of the application form.

Personnel on active duty, wherever stationed: Forward the application via your commanding officer.

Personnel not on active duty, but a member of a Reserve pay unit, or associated with such unit: Forward the application via the unit commander and such other official channels as may be locally prescribed.

Personnel not on active duty and not a member of a pay unit or associated with such unit: Forward the application via the district commandant. If a member of a non-pay unit under the cognizance of the Chief of Naval Air Reserve Training, forward via the command instead of through the district commandant.

Complete the application form in all respects.

Caution! DO NOT send applications for enrollment in medical correspondence courses to the U.S. Naval Correspondence Course Center, Brooklyn, N. Y. Such procedure delays the processing of the application for several weeks. Send to that address only applications for enrollment in courses administered by that center.

Medical personnel may be enrolled in more than one Medical Department correspondence course at one time. Texts and materials required to complete the assignments are furnished the enrollee.

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AVIATION MEDICINE SECTION



Aviation Medical Center Founded

A "significant milestone" in the development of the Navy's aviation medical training, research, and practice was attained April 30 with the commissioning of a Naval Aviation Medical Center in Pensacola, Fla.

The center—the first of its kind in the United States—was established in Pensacola, noted as "The Cradle of Naval Aviation," to integrate clinical training and research functions of the U. S. Naval School of Aviation

Medicine and the Pensacola Naval Hospital, both located at the Pensacola Naval Air Station under one command. The dedication address was delivered by Rear Admiral B. W. Hogan, Surgeon General and Chief of the Bureau of Medicine and Surgery.

The Naval Aviation Medical Center will be responsible for the training of officers and enlisted naval aviation medical personnel and the many research projects currently being conducted in naval aviation medicine in addition to the medical care of patients in the Pensacola area.

The unified command is expected to bring about operating economies, better utilization of skilled medical personnel by creating a "pool" of these persons available for all the functions of the center and, finally, to make possible more effective administration.

The center will make it possible for the Navy's student flight surgeons who are being trained to attend to the medical needs of the Navy's aviators to have the clinical care of patients as a significant part of their graduate training. It will now also be possible for unusual or problem cases among aviation personnel throughout the Navy to be referred to the center for consultation or to be hospitalized for study by the center's clinical and aviation medicine specialists.

Commanding Officer of the center is Captain Lester E. McDonald MC USN, a veteran Navy flight surgeon of 28 years' service and a Naval aviator since 1937. Captain McDonald's immediate superior will be the Chief of Naval Air Training, presently Vice Admiral A. K. Doyle USN. The center will be under the management and technical control of the Bureau of Medicine and Surgery. Serving under Captain McDonald as Commanding Officer of the 325-bed U. S. Naval Hospital, Pensacola, is Captain J. V. Land MC USN, a Naval flight surgeon. The hospital which has an average patient load of about 285 has a staff of approximately 70 officers, 160 enlisted men, and 180 civilian employees.

Serving as Commanding Officer of the U. S. Naval School of Aviation Medicine is Captain J. C. Early MC USN who is both a flight surgeon and Naval aviator. The school has a staff of approximately 35 officers, 70 enlisted men, and 30 civilian employees. Since the Naval School of Aviation Medicine was organized at Pensacola in 1939, some 2150 Naval flight surgeons and aviation medical examiners have been graduated.

The flight surgeon's course at the school covers a period of 23 weeks. The academic phase is completed in 17 weeks and the remaining 6 weeks are devoted to indoctrination flight training. Student flight surgeons who meet the requirements are authorized to solo in training aircraft.

The research program at the School of Aviation Medicine is organized under nine parent projects: Stress Due to Acceleration and Deceleration; Stress Due to High Altitudes; Stress Due to High Intensity Noise; Physical and Psychological Standards for Aviation Personnel; Aviation Safety, Escape, and Rescue; Training and Re-Education of Aviation Personnel; Studies on

Psychophysiology, Including Sensations and Illusions; Problems in Human Engineering; and Miscellaneous Problems Involved in Aviation Medicine.

* * * * *

Drugs and the Flyer

Liaison Between the Flight Surgeon and the Dental Surgeon*. "Lack of liaison between the flight surgeon and the dental surgeon is a potential danger area in the aircrew effectiveness program that is often overlooked. Not infrequently, dentists give medication to personnel on flying status without assuring that this fact is brought to the attention of the flight surgeon."

The taking of some drugs used in dentistry is contraindicated while flying. Fortunately, to date no aircraft accidents have been directly attributed to this practice.

* Extract: TIG Brief, Nr 8, Vol VIII, 18 Apr 56.

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Liquid Oxygen Facts

Flight surgeons are reminded to review the instruction contained in BuAer Aviation Clothing and Survival Equipment Bulletin #5-56 of 10 May 1956, and the latest publication concerning liquid oxygen equipment, namely, BuAer Aviation Clothing and Survival Equipment Bulletin #7-57 of 1 March 1957. Both publications are held by the local Squadron Oxygen Officer.

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BuMed Instruction 6100.3 of 23 May 1957

- Subject:** Recommendation for grounding and clearance of aviation personnel for actual control of aircraft; standardization of forms for
- Purpose:** To standardize the forms used for recommending grounding and clearance of flight personnel at all aviation activities.
- Ordering:** Standardized forms, Grounding Notice (Aero-Medical) NavMed-1380 and Clearance Notice (Aero-Medical) NavMed-1381, shall be ordered in accordance with references (e) and (f) on the 11-part DD Form 1149 from the appropriate Forms and Publications Supply Distribution Points.

Fourth Annual Postgraduate Course
in Aviation Medicine

The Fourth Annual Postgraduate Course in Aviation Medicine for Physicians and Scientists will be held at the Health Center, Columbus, Ohio, September 9 - 13, 1957, under the auspices of the Ohio State University, College of Medicine and the Medical Division of the Civil Aeronautics Administration. The tuition is \$75.00.

This refresher course is designed for physicians and others interested in the health and safety aspects of flying. Basic information will be brought up to date, but chief emphasis will be upon new material not covered in previous annual programs. Additional time will be given to conference-type discussions of problems submitted by those enrolled in the course and led by participating lecturers.

Optional field visits to the Medical Research Unit at Wright Air Development Center, the Medical Research Laboratory, Civil Aeronautics Administration or to North American Aviation will be arranged. On Monday, September 9, a social hour will precede a dinner discussion of the Major Problem Areas of Civil Aviation Medicine.

Applications should be addressed to Dr. William F. Ashe, Chairman, Department of Preventive Medicine, Ohio State University Health Center, Columbus 10, Ohio.

BuMed Instruction 1520.8 applies.

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Change in Manual of the Medical Department

Old Chapter 12, Article 12-2 (1), of the Manual of the Medical Department has been deleted. This was done in view of the fact that all Aero-Medical Evacuation aircraft are now of the pressurized cabin type. This deletion is reflected in Page Change-5.

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Recent Research Reports in Aviation Medicine

Naval Aviation Material Center, Philadelphia (ACEL)

1. NAMC-ACEL-311, 7 Feb 1957, Oxygen System Contamination, Investigation of
2. NAMC-ACEL-326, 27 Feb 1957, The Measurement of Stress and Its Relationship to Performance

3. NAMC-ACEL-317, 1 March 1957, Effect of High Velocity Air Blast on Ejection Seat Face Curtain Installation and Pilot's Flight Gear
4. NAMC-ACEL-332, 19 March 1957, Measurement of Skin Heating During Exposure to Infrared Radiation.
5. NAMC-ACEL-333, 3 April 1957, Air Crew Equipment Laboratory
6. NAMC-ACEL-339, 10 May 1957, Human Engineering Investigations of the Interior Lighting of Naval Aircraft

Naval Air Development Center, Johnsville (AMAL)

1. NADC-MA-5703, 29 January 1957, The Effect of Mitochrome on Adenylate Kinase
2. NADC-MA-5704, 1 March 1957, Arterial Blood Pressure Responses to Abrupt Positive Acceleration

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Measurement of Cardiac Output (7160-71812)

A research program has been initiated in which cardiac output data obtained from injection of radioactive isotopes into circulatory blood will be checked against similar data using the standard method. The standard method involves analysis of blood taken directly from the heart through catheterization. The right auricle and base of the aorta will be catheterized simultaneously in normal, adult male, human subjects, and cardiac output will be measured. Pressure breathing studies will include observations of variations in pressure gradient from left to right heart and alterations in cardiac output.

If the isotope method is proved by catheterization studies to be accurate, it will provide a rapid bloodless procedure for clinical use in the field of cardiovascular pathology. It will also be an important research tool in high altitude physiology where evaluation of protective equipment necessitates the use of indirect methods exclusively.

(Activity Report from Aero Medical Laboratory RCS WADC-U16 of 4 April 1957, Captain T.F. McGuire, MC WCRDF-3)

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Aviation Accidents in 1955

While aviation injuries accounted for only 3% of all Navy and Marine Corps sicklist admissions due to accidents in 1955, they were responsible for over 30% of the accidental deaths. When compared with all other causes

of death in 1955, accidental or disease, these 407 aviation deaths were second in number only to motor-vehicle deaths.

The 960 men admitted to the sicklist during 1955 for treatment of aviation injuries accounted for almost 19,000 sick days.* This meant an average of 20 sick days per admission. On an average, 6 people out of every 100,000 in the Naval services were noneffective each day due to aviation accidents. (Table A)

Table A.--MANPOWER LOSS DUE TO AVIATION ACCIDENTS,
NAVY AND MARINE CORPS: 1955

(Rates per 100,000 average strength)

BRANCH OF SERVICE	ADMISSIONS		SICK DAYS			DEATHS	
	Number	Rate	Number	Non-effective rate	Average per new case	Number	Rate
Total..	960	108.5	18,983	5.9	19.8	407	46.0
Navy	754	111.4	16,152	6.5	21.4	291	43.0
Marine Corps..	206	98.9	2,831	3.7	13.7	116	55.7

Source: NAVMED-N, Certificate of Death, and NAVMED-F. Individual Statistical Report of Patient.

As compared with other types of accidents, fewer of those injured in aviation accidents survived for a day or longer. Of all these deaths, more than 96% were within command or on duty. Deaths numbered 42 for every 100 admissions, resulting in a loss of 46 men per 100,000 average strength.

Table B shows the characteristics of the men who died. Of the 407 deaths, 291 were Navy and 116 were Marines. A greater loss, relative to strength, was shown by the Marine Corps: 56 per 100,000 as compared

* While this article was being prepared for publication, certain data were tabulated relating to aviation accidents for calendar year 1956. These data showed that, in 1956, there were 413 deaths, 1078 admissions to the sicklist, and 23,300 sick days due to aviation accidents among Navy and Marine Corps personnel.

Table B.-- AVIATION DEATHS, BY PERSONNEL CHARACTERISTICS, NAVY AND MARINE CORPS: 1955

CHARACTERISTIC	NUMBER	RATE PER 100,000
Total	407	46.0
TYPE OF PERSONNEL		
Navy.....	291	43.0
Officers	179	237.5
Officer candidates	10	138.5
Enlisted	102	17.2
Marine Corps.....	116	55.7
Officers.....	90	485.4
Enlisted.....	26	13.7
STATION		
Continental.....	263	54.5
Noncontinental.....	84	80.9
Ships.....	60	20.1
AGE (YEARS)		
Under 20.....	10	4.8
20-24.....	172	44.5
25-29.....	105	87.8
30-34.....	74	85.5
35-39.....	33	63.6
40 and over.....	13	41.3
LENGTH OF ACTIVE SERVICE (YEARS)		
Under 1.....	12	8.1
1.....	43	33.3
2-7.....	226	59.3
8-19.....	123	57.7
20 and over.....	3	22.3

Source: NAVMED-N, Certificate of Death.

with 43 per 100,000 for Navy. It should be pointed out, however, that these rates do not take into account the number of personnel on flying status in the respective services.

Two out of every three decedents were officers. This resulted in very high death rates for both Navy and Marine Corps officers. The death rate for Marine Corps officers (485 per 100,000), however, was more than twice the rate for Navy officers (238 per 100,000). Enlisted men had a low death rate: 17 per 100,000 for Navy and 14 per 100,000 for Marine Corps.

The death rate from aviation accidents for personnel stationed on ships (20 per 100,000) was smaller than for those stationed ashore. As would be expected, aircraft-carrier personnel accounted for the bulk (over 90%) of the aviation deaths among ships' crewmen. Noncontinental stations produced the highest death rate, 81 per 100,000.

Men between the ages of 25 and 34 produced a death rate due to aviation accidents of 87 per 100,000 average strength. This was almost twice the death rate of the entire Navy. Personnel in the 35 to 39-year age group also had a high death rate - 64 per 100,000. Men under 20 showed a death rate of only 5 per 100,000.

In 1955, men who were in the service for 2 years or longer had the highest death rate due to aviation accidents, 58 per 100,000 average strength. Men in service less than one year had the lowest death rate, 8 per 100,000. (Table B)

Aviation accidents may be classified as flight, parachuting, and non-flight or ground accidents. Flight accidents include those which occur during landing operations, takeoffs, midair collisions, and other terminations of flight. Accidents which occur while boarding or alighting from aircraft, being hit by falling aircraft, and other pre- and postflight accidents are included in ground accidents.

Half of all aviation injuries were incurred in "flight" accidents and more than 3 out of every 4 of them resulted in death. Midair collisions resulted in the greatest number of deaths among flight accidents - 15% of all aviation deaths. Of those injured in midair collisions, 94% died.

Although landing accidents produced more injuries than midair collisions, the case fatality ratio was considerably lower - 37 deaths per 100 admissions. The ratio of officers to enlisted men in this category did not differ greatly from the over all figure.

The greatest death factor, however, was unspecified crashes and other terminations of flight. Thirty percent of all injuries and 59% of all deaths were in this category (Table C). The case fatality ratio was 85 for every 100 admissions.

Parachuting accidents, fatal and nonfatal, were comparatively few. Most of the injuries were incurred on impact after landing, while the most prevalent cause of death was failure of the parachute to open.

Injuries occurring in accidents not incident to air flight had the smallest fatality ratio per 100 admissions for aviation accidents. The most frequent

cause of injury in this category was falling from standing aircrafts - over one-fourth of the ground accidents. Being hit by falling aircraft and parts of aircraft resulted in another fourth of the injuries in aviation-ground accidents. While the former cause accounted for no deaths, the latter accounted for two-thirds of all aviation-ground accident deaths (Table C).

Table C.--CAUSES OF AVIATION INJURIES AND DEATHS,
NAVY AND MARINE CORPS: 1955

CAUSE	ADMIS- SIONS	DEATHS	DEATHS PER 100 ADMIS- SIONS
Total	960	407	42
Flight accidents.....	482	371	77
Takeoffs.....	41	29	71
Midair collisions.....	65	61	94
Explosions in flight.....	16	12	75
Landings.....	75	28	37
Crashes, unspecified.....	283	240	85
Other.....	2	1	50
Parachuting.....	38	9	24
Incident to flight.....	25	7	28
Not incident to flight...	13	2	15
Ground accidents.....	440	27	6
Hit by falling aircraft..	106	18	17
Fall from standing air- craft.....	122	-	-
Boarding or alighting....	37	-	-
Jet blast or intake.....	21	2	10
Taxiing.....	14	1	7
Other.....	140	6	4

Source: NAVMED-N, Certificate of Death, and
NAVMED-F, Individual Statistical Report of Patient.

(Prepared by Medical Statistics Division, Bureau of Medicine and Surgery,
8 April 1957)

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Harvard-Guggenheim Center for
Aviation Health and Safety

Establishment of the Harvard-Guggenheim Center for Aviation Health and Safety at Harvard University's School of Public Health in Boston was announced jointly by President Nathan M. Pusey of Harvard University, and Harry F. Guggenheim, President of the Daniel and Florence Guggenheim Foundation. The new center will study responses of the human body to extreme speeds, altitudes, temperatures, and toxic agents in flight and on the ground, and carry on basic research in the prevention and control of the increasing dangers of the air age.

The Center, made possible by a grant of \$250,000 from the Daniel and Florence Guggenheim Foundation over a five-year period will begin operation with the start of the 1957-58 academic year under Dr. Ross A. McFarland. Two Daniel and Florence Guggenheim Fellowships of \$5000 each will be awarded annually for graduate study at the new Center. Applications for these Fellowships are currently being received and considered.

The Harvard-Guggenheim Center will serve three basic purposes: To unify basic research into the sharply increasing human problems of the jet era; to give advanced training to physicians, biological scientists, and aeronautical engineers; and to serve as a clearinghouse for technical information on aviation health and safety. It will apply the "Interdisciplinary" or team approach, coordinating the work of such diverse specialists as engineers, physicians, psychologists, physiologists, and anthropologists in solving problems of health and safety in flight.

According to Dr. John C. Snyder, Dean of the School of Public Health, the new Center will provide "the first comprehensive teaching and research effort developed at a major medical and health center, where all the allied specialties relating to aviation and human engineering will be concentrated on the training of medical and engineering graduates, and on making creative research studies at a basic level."

The Harvard-Guggenheim Center, the fifth aviation research center established by the Daniel and Florence Guggenheim Foundation since 1949, is the first devoted to problems of aviation health and safety. Other Daniel and Florence Guggenheim Centers include the Jet Propulsion Centers at Princeton University and California Institute of Technology, founded in 1949; the Aviation Safety Center at Cornell University, founded in 1950; and the Institute of Flight Structures at Columbia University, founded in 1954. The Harvard-Guggenheim Center will coordinate its work with these Centers.

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A Flight Surgeons' Meeting

At the subcommittee meeting of flight surgeons, a "CPC" of three aircraft accident reports was considered. Each demonstrated some unfortunate occurrence which indicated "it can happen here."

Case 1. The air group flight surgeon was known to have as close contact with his aviators as possible, yet at the death of one of his pilots in an unsolved accident that same flight surgeon learned things about the deceased pilot that would curl your hair. Other members of the squadron made observations which indicated the pilot was inadequate; but their observations were never revealed to the flight surgeon, the operations officer, or any officer in the squadron. Pilots must be constantly reminded that tipping off the flight surgeon about some pilot's performance may be a great favor to that other pilot. No flight surgeon wishes to form a gestapo, but he would like the chance to be of help.

Case 2. Two AD's were flying together, the first had engine trouble at 1000 feet and said he was going to bailout. His wing man radioed that he was too low to bailout. The pilot landed with his safety belt and shoulder harness unfastened. He was killed. We will have to keep repeating time and time again "when you decide to bailout or eject, don't think any more about it, DO IT!"

Another feature of this report was the fact that an enlisted man serving as a tower observer started toward the crash in a jeep. When he saw the helicopter hovering over the crash, he turned his jeep around and went back to his station. He said that he felt that the presence of the helicopter meant that the Medical Department had a representative on the scene and, therefore, he did not have to go in any further. This indicates that we must continuously hammer away at the concept that first-aid is an all-hands job, not a Medical Department primary mission.

Case 3. A very fine aviator ran his AD in a vertical dive to the ground. The day of the accident he came back from leave at 0400; he slept in the ready room until 0800. He practiced eight loft maneuvers that morning; in the afternoon he did two more; on the third run in, it happened. The accident may have been caused by his unfamiliarity with a new instrument, (18A LABS.), but physical exhaustion at least was a factor if not the fundamental cause of this pilot's death. The accident report brought out the fact that the pilot was not required to fly; but it seems reasonable to expect that someone around the squadron, such as the operations officer, the flight surgeon, or some other pilot, would have recommended grounding him for the day solely on the basis of inadequate rest. Safety is everybody's business.

The remedies for these unfortunate incidents are not easily written on paper. These cases might be useful as examples to show why the flight surgeon needs more "talk" from and with pilots. Every flight surgeon is willing to "listen" if given a chance.

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Charter of the Royal Naval Medical Service

The new Charter granted in 1800 to the Royal College of Surgeons (40. Geo. III) again contained a section stating that "the Examiners of the College of Surgeons hereby established, shall examine all Surgeon's instruments to be used in our Service, which they shall be required in like manner to examine, and shall return such Instruments, when examined, to such Person or Persons as shall be appointed to receive the same, with such Certificate, in such Form and properly sealed up, or otherwise authenticated in such manner as the Officer or Officers, from time to time to be appointed by Use for such Purposes, shall require."

It is more than likely that this obligation had lapsed into a mere matter of routine until on 18 December 1812 the Secretary of the College, Mr. Edmund Belfour, laid before the Court of Examiners a letter from the Secretary to the Commissioners for Transport, et cetera, enclosing a list of the Instruments required to be provided by Surgeons in the Navy and requesting the opinion of the Court as to any improved arrangement that should be made of such a list, with regard to any instruments mentioned therein. This list was one provided by Messrs. Evans & Co., Instrument-makers, of Old Change, and was as follows:

Three amputating Knives	Two gum elastic Catheters
One amputating Saw with Spare Blade	Six Scalpels
One metacarpal Saw with spare Blade	Small Razor
Two Catlins	Key-tooth instrument
Pair of Artery Forceps	Two Pairs of Tooth Forceps
Two dozen curved Needles	Two Seton Needles
Two Tenaculums	Curved Bistory with a Button
Six Pettit's screw Tourniquets	Pair of strong Probe Scissors
Pair of Bone Nippers and Turnscrew	Long Probe
Three Trephines	Pair of Bullet Forceps
Saw for the Head	Scoop for extracting Balls
Rugine	Two Probangs
Pair of Forceps	Half a pound of ligature Thread
Elevator	One paper of Needles
Brush	Case, with lift-out
Two Trocars	Apparatus for restoring suspended
Two silver Catheters	Animation

Set of Pocket Instruments	Two eighteen-tailed Bandages
Six Lancets, in a Case	Twenty Yards of Web for Tourniquets
Two dozen Bougies, in a case	Sixty yards of Tape, different Breadths
Two Pint Pewter Clyster Syringes	Gum Lancet
Two sets of bundles of common splints	Punch
Set of Japanned Iron Splints for Legs	A cupping Apparatus, consisting of
Twelve Flannel or Linen Rollers	One Scarificator and Six Glasses

After due consideration, the Court made the following resolution:

"That the following instruments, and specified Portion of the Apparatus for restoring suspended Animation should be expunged from such List, Viz.: Lenticular, because, not only an useless, but a very dangerous Instrument. Probe Scissors, because improper to be used in any operation of Surgery. That Portion of the Apparatus for the use of the Smoke of Tobacco in the Case of suspended Animation because, Tobacco in such Case, howsoever employed, so far from animating, must always have a deadly tendency. And consequently, that the Instructions for the use of Tobacco should be expunged from the printed Directions accompanying the Apparatus."

The Court also decided that the following Instruments should be added to the list:

"A second Pair of Artery Forceps, that the Privation from any Cause of this useful Instrument may be properly supplied."

"A second curved Bistory that the want of this necessary Instrument may not occur."

(Excerpt from the Journal of the Royal Naval Medical Service, No. 1, Winter 1957. Vol. XLIII)

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Improvement in Functional Capability of Precooked Frozen Meals

The maximum recommended temperature for holding precooked frozen meals aboard aircraft has been raised from 0° F. to not more than 40° F. for 36 hours immediately prior to consumption, or not more than 25° F. for 7 days immediately prior to consumption. Aircraft refrigerators may be smaller and lighter and will require less power in meeting these less stringent storage temperatures. Another advantage of storage at these higher temperatures aboard aircraft is a decrease in the time required for heating the meals. Heating time is decreased 10 minutes or more when the meals are thawed before being placed in the oven. In the event that meals stored at these higher temperatures are not consumed

within the time limits, they must be destroyed as a safety precaution. Because of their perishable nature, care must be exercised to insure that meals are kept at 0° F. or below at all times during previous transportation and storage to insure that wholesome, highly acceptable meals are available.

(Aero Medical Lab., Wright Air Dev. Ctr., Activity Report of 15 May 1956)

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Change of Address

Please forward requests for change of address for the News Letter to: Commanding Officer, U. S. Naval Medical School, National Naval Medical Center, Bethesda 14, Md., giving full name, rank, corps, and old and new addresses.

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The printing of this publication has been approved by the Director of the Bureau of the Budget, 16 May 1955.

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